APPENDIX E
GEOLOGIC LOGS OF CORE SEGMENTS

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Table E1-a
Alluvium Logging Form for Borehole NC-EWDP-10P (Core)

Borehole ID: **NC-EWDP- 10P** (Phase 3) Driller/Drilling Company: THF Drilling Method: IR75W/Casing Advance Alluvium Depth (ft bgs): 0 to 787.5 Start Date: 9/10/2001 End Date: 12/17/2001 Page 1 of 1

Date Logged	Logged By (Initials)	Date Checked	Checked By (Initials)	Sample Number	Sample Type	Depth Interval (feet bgs)		Drilling/Coring Data					Sample Density Measurements			Munsell Color Symbol	Moisture Content			Particle Size Distribution (%)					Gra-ding		Estimated Plasticity					USCS Group Symbol	Gravel/Sand GrainShape				Cementation				HCL Reaction			Major Rock Type (%)		
						From	To	Liquid Drilling Fluid Injection Rate (mm)	Drilling/Coring Rate (feet/min)	Water Production (gpm)	Sample Recovery (gallons)	Borehole/Core Diameter (inches)	Tare Weight (kg)	Sample Plus Tare Weight (kg)	Sample Weight (kg)		Dry	Moist	Wet	Gravel	Sand	Silt	Clay	Fines (Silt plus Clay)	Well Graded	Poorly Graded	None	Low	Moderate	High			Angular	Subangular	Subrounded	Rounded	None	Weak	Moderate	Strong	None	Weak	Strong	Volcanics	Carbonates	Other
11/13/2002	BW	1/29/2003	JSW	DC-10P-1-4	Core	58.35	58.85	0.0	1.0			4.0				5YR 5/4	☑	☐	☐						☑	☐	☑	☐	☐	☐			☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/13/2002	BW	1/29/2003	JSW	DC-10P-2-4	Core	168.22	168.72	0.0	0.8			4.0				10YR 5/4	☑	☐	☐						☑	☐	☑	☐	☐	☐			☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/25/2002	BW	1/29/2003	JSW	DC-10P-4-4	Core	666.47	666.97	0.0	0.5			4.0				5YR 4/4	☑	☐	☐						☑	☐	☐	☐	☑	☐			☑	☐	☐	☐	☐	☐	☐	☑	☑	☐	☐	100		
12/2/2002	BW	1/29/2003	JSW	DC-10P-4-6	Core	667.47	667.72	0.0	0.8			4.0				5YR 5/4	☑	☐	☐						☑	☐	☑	☐	☐	☐			☐	☑	☐	☐	☑	☐	☐	☐	☑	☐	☐	100		
12/2/2002	BW	1/29/2003	JSW	DC-10P-5-4	Core	703.16	703.66	0.0	0.3			4.0				5YR 5/3	☑	☐	☐						☑	☐	☑	☐	☐	☐			☐	☑	☐	☐	☑	☐	☐	☐	☑	☐	☐	100		
12/2/2002	BW	1/29/2003	JSW	DC-10P-5-6	Core	704.16	704.41	0.0	0.3			4.0				5YR 5/3	☑	☐	☐						☑	☐	☑	☐	☐	☐			☐	☑	☐	☐	☑	☐	☐	☐	☑	☐	☐	100		
12/2/2002	BW	1/29/2003	JSW	DC-10P-6-4	Core	743.11	743.61	0.0	0.5			4.0				5YR 5/3	☑	☐	☐						☐	☐	☑	☐	☐	☐			☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
12/2/2002	BW	1/29/2003	JSW	DC-10P-6-6	Core	744.11	744.36	0.0	0.5			4.0				5YR 5/3	☑	☐	☐						☑	☐	☑	☐	☐	☐			☐	☑	☐	☐	☑	☐	☐	☐	☑	☐	☐	100		

Table E1-b
Alluvium Logging Comments for Borehole NC-EWDP-10P (Core)

Borehole ID: **NC-EWDP- 10P** (Phase 3)

Date Logged	Sample Number	Depth From	Depth To	Comments
11/13/2002	DC-10P-1-4	58.35	58.85	Gravel component consists of 85% glassy densely to non-welded tuffs, 10% felsic flows and 5% vescicular basalt. 100% are hard unweathered clasts. Max size = 6". Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/13/2002	DC-10P-2-4	168.22	168.72	Gravel component consists of predominantly glassy and densely-welded ashflow tuff; 95% are hard unweathered and 5% weakly weathered. Max size = 2". Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/25/2002	DC-10P-4-4	666.47	666.97	Gravel component is 90% hard densely welded ashflow tuff clasts. 58% are < 2"; 42% are >= 2". Very hard crystalline clasts. Sand component is 50% densely-welded and 50% non-welded clasts. Only 10% non-welded clasts are present in gravel faction. 25% of gravel clasts have hard well-cemented grain coatings, but no indication that clasts are cemented together. Moisture content recorded as dry for all samples - samples were dry at time of logging.
12/2/2002	DC-10P-4-6	667.47	667.72	Gravel component is: 80% > 3/4"; 60% > 1.5". Clasts are 100% non-to weakly welded ashflow tuff. 50% of clasts are crystal rich, and display flow banding & spherulitic texture. Grain coatings on gravel clasts are absent. There is no indication of cementation. 5% of gravel clasts contain small (1/25" to 2/25") white, erodible pumice. One large clast (1") is oxidized red and contains 80% yellowish pumice. Sand component is 60-70% light colored, non-to weakly-welded clasts; 30-40% welded. Moisture content recorded as dry for all samples - samples were dry at time of logging.
12/2/2002	DC-10P-5-4	703.16	703.66	Gravel component is: 70% > 3/4"; 50% > 1.5". 75% of clasts are non-welded, crystal and pumice poor. 20% are weakly-welded, crystal rich; 5% are densely welded. The largest gravel clasts (>2") contain calcedonic quartz and display spherulitic texture. These clasts are very hard. Sand component is pumice-rich and 75% non- to weakly welded ashy ground mass. No densely welded clasts are present. Pumic is very soft: turns to mush with water. Moisture content recorded as dry for all samples - samples were dry at time of logging.
12/2/2002	DC-10P-5-6	704.16	704.41	Very hard and abrasive sandy grain coatings cover 5 to 10% of the gravel clasts and may represent relic cementation. Gravel component is: 50% > 3/4", 3% > 1.5". Gravel lithology is roughly equal proportions of densely, weakly, and non-welded ashflow tuffs. All appear to be hard to very hard. Sand component is 90% ashy, non- to weakly welded fragments of groundmass - crystal and lithic poor. Contains minor (<1%) soft white pumice that becomes mush with water. Moisture content recorded as dry for all samples - samples were dry at time of logging. Origin of clay is possibly in part the soft erodible pumice.
12/2/2002	DC-10P-6-4	743.11	743.61	Gravels are predominantly (>90%) non-welded ashflow tuff clasts. All clasts are very crystal rich and 25% have numerous cavities where crystals have been plucked out. Gravels are hard and pumice poor. 11% of gravel > 3/4", 22% > 1". Sand component is 100% crystal poor ashy groundmass, non-welded, and is very dissimilar from hard crystal rich gravel component. Moisture content recorded as dry for all samples - samples were dry at time of logging.
12/2/2002	DC-10P-6-6	744.11	744.36	Gravels are non- to weakly welded, hard, pumice poor, crystal rich; 50% of gravels are > 3/4", 35% > 1.5". 25% of gravel clasts have numerous cavities where grains have been plucked out. Sand component is predominantly (95%) non-welded fragments of ashy matrix, crystal poor (as opposed to gravel component). Moisture content recorded as dry for all samples - samples were dry at time of logging.

Table E2-a
Alluvium Logging Form for Borehole NC-EWDP-22PA (Core)

Borehole ID: **NC-EWDP- 22PA** (Phase 3) Driller/Drilling Company: THF Drilling Method: TH75W/Casing Advance Alluvium Depth (ft bgs): 0 to 780 Start Date: 1/15/2002 End Date: 2/5/2002

Date Logged	Logged By (Initials)	Date Checked	Checked By (Initials)	Sample Number	Sample Type	Depth Interval (feet bgs)		Drilling/Coring Data					Sample Density Measurements			Munsell Color Symbol	Moisture Content			Particle Size Distribution (%)					Grading		Estimated Plasticity				USCS Group Symbol	Gravel/Sand GrainShape				Cementation				HCL Reaction			Major Rock Type (%)		
						From	To	Liquid Drilling Fluid Injection Rate (gpm)	Drilling/Coring Rate (feet/min)	Water Production (gpm)	Sample Recovery (gallons)	Borehole/Core Diameter (inches)	Tare Weight (kg)	Sample Plus Tare Weight (kg)	Sample Weight (kg)		Dry	Moist	Wet	Gravel	Sand	Silt	Clay	Fines (Silt plus Clay)	Well Graded	Poorly Graded	None	Low	Moderate	High		Angular	Subangular	Subrounded	Rounded	None	Weak	Moderate	Strong	None	Weak	Strong	Volcanics	Carbonates	Other
11/7/2002	BW	1/29/2003	JSW	DC-22PA-1-4	Core	392.25	392.75	0.0	1.5			4.0				5YR 5/6	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/7/2002	BW	1/29/2003	JSW	DC-22PA-1-6	Core	393.25	393.50	0.0	1.5			4.0				5YR 5/6	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/19/2002	BW	1/29/2003	JSW	DC-22PA-3-3	Core	553.24	553.74	0.0	1.1			4.0				5YR 4/4	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/19/2002	BW	1/29/2003	JSW	DC-22PA-4-3	Core	572.64	573.14	0.0	0.7			4.0				5YR 5/2-5/4	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☑	☐	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/19/2002	BW	1/29/2003	JSW	DC-22PA-5-3	Core	670.11	670.61	0.0	1.0			4.0				5YR 4/4	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/13/2002	BW	1/29/2003	JSW	DC-22PA-6-5	Core	710.33	710.58	0.0	1.3			4.0				10YR 5.5/5	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/19/2002	BW	1/29/2003	JSW	DC-22PA-7-3	Core	740.85	741.35	0.0	0.8			4.0				5YR 4/4	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☐	☑	☐	☑	☐	☐	☐	☑	☐	☐	100		
11/25/2002	BW	1/29/2003	JSW	DC-22PA-7-5	Core	741.85	742.10	0.0	0.8			4.0				5YR 4/4	☑	☐	☐						☑	☐	☑	☐	☐	☐		☐	☑	☐	☐	☐	☐	☐	☑	☑	☐	☐	100		

Table E2-b
Alluvium Logging Comments for Borehole NC-EWDP-22PA (Core)

Borehole ID: **NC-EWDP- 22PA** (Phase 3)

Date Logged	Sample Number	Depth From	Depth To	Comments
11/7/2002	DC-22PA-1-4	392.25	392.75	A very weak cement was noted while logging sample. Gravel component consists of 90% non-welded and densely welded tuffs and 10% (1 clast approx 4") that is a crystal-rich moderately welded unit: 95% are hard unweathered, 5% weakly weathered. Gravel is subrounded to round, approximately 20% are > 1". Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/7/2002	DC-22PA-1-6	393.25	393.50	Gravel component consists of 100% non-welded and densely welded tuffs: 95% are hard unweathered, 5% weakly weathered. Approx 20% > 1"; all subround to rounded. A very weak cement was noted while logging sample. Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/19/2002	DC-22PA-3-3	553.24	553.74	Gravel is 100% non-to densely welded tuff, and rare chert. 100% is hard and unweathered. 20% of gravels are > 3/4". Sand component is well-graded, 25% is non-welded, 5% of grains have open/porous matrix, sand contains 1-2% pumice. Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/19/2002	DC-22PA-4-3	572.64	573.14	Gravels are approx. 50% hard glassy densely to weakly welded tuff and 50% non-welded tuff. All are mostly fresh, hard, and sl. weathered. Well developed sand coatings are on 1% of gravel clasts. Either cementation is occurring only locally, or gravels are derived from strongly cemented strata. Cement is hard. 33% of gravels are > 3/4". Sand component=1-3% white and greenish pumice, and only approx 15-20% hard glassy flow, 75% tuff. Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/19/2002	DC-22PA-5-3	670.11	670.61	Gravels are approx 50% ashflow tuff, non-to densely welded; 35% shallow intrusive clasts with primary igneous texture; 15% glassy felsic flow. Gravels are hard, unweathered. Sand component = 1-3% greenish pumice, 1-3% non-welded, white and pink ash matrix, 90% weakly to densely welded ashflow. Trace clasts of intrusives. 80% of gravel > 3/4", 45% is > 1". Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/13/2002	DC-22PA-6-5	710.33	710.58	Gravel component consists of 85% partially to densely welded tuff, 10% rhyolitic clasts of glassy flow, 5% non- to weakly welded crystal rich tuff. 95% hard unweathered rock. Sand component is 75% non-welded tuff clasts. Also pumice clasts are present in sand but not gravel component. Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/19/2002	DC-22PA-7-3	740.85	741.35	Gravels are 100% hard, unweathered ashflow tuff. 75% are densely welded, 25% partially welded. No grain coatings are present, as in sample described above. Also no intrusives. Sand component = approx 60% is non-welded tuffs (much more than present in gravel component), sand contains ~ 40% welded fragments. Moisture content recorded as dry for all samples - samples were dry at time of logging.
11/25/2002	DC-22PA-7-5	741.85	742.10	Gravel component is predominantly densely to non-welded tuff and 1% basaltic clasts. 70% are >= 3/4"; 30% are > 3/4". Clasts are very hard. Well developed sandy coatings are present on ~60-70% of gravel clasts. Coatings are very hard and cemented. Also coarse grains are cemented together. Sand component is 75% non- to weakly welded fragments of ash matrix with 5-10% of hard welded clasts. Sand fraction contains fragments of soft, white, and highly clay altered fragments of porous, ashy, volcanic lithics. Resembles kaolinite. Moisture content recorded as dry for all samples - samples were dry at time of logging.